

Opinion of Probable Construction Costs

This document provides an opinion of probable construction costs for the Reno Railroad Corridor Project. This opinion was prepared as part of preliminary engineering undertaken for the Locally Preferred Alternative identified within the Environmental Impact Statement (EIS)¹ prepared for the project. This opinion of probable construction costs has been prepared based upon materials quantities and unit costs for project items identified in preliminary engineering as necessary to construct the selected design alternative. No attempt was made to include pre- or post-construction costs, including, but not limited to, maintenance, project-procurement, legal defense, or fundraising. The quantities were developed from preliminary and incomplete plans. The presented opinion was based on a single concept for construction outlined by the City of Reno and assumes the scope of work defined in the contract between the Nolte Team and its clients.

The means and methods used in developing cost information is briefly described below:

Shoofly

This category of work includes items required for the installation of the proposed shoofly on and about Commercial Row. Most notably, this group contains temporary road crossings, associated signaling and track work. In addition, this category also includes roadwork items required to prepare the subgrade of the shoofly. The most prominent roadwork items included in this subgrade preparation are asphalt concrete, temporary railing and reconstruction of roadway items after the shoofly is removed.

Quantities for temporary road crossings, associated signaling and track work were developed by examining the preliminary engineering plans. Where necessary application of standards from the American Railway Engineering Association (AREA) Manual and those supplied by Union Pacific Railroad yielded supplemental quantities. Subgrade quantities were developed through review of the preliminary engineering plans. All of the quantities in this section were developed for both single- and double-track shoofly where applicable.

The unit costs for items directly related to the track work (i.e. crossings, sub-ballast, rails and ties) have been developed with input from the Union Pacific Railroad. The costs for the roadway related items were developed with input from local contractors that continually provide construction services in the Reno vicinity.

Trench Construction

The Trench Construction grouping includes items of construction within the limits of the proposed trench. Specifically, the assumed trench section is to be constructed of diaphragm walls and a jet-grouted/reinforced concrete cast-in-place concrete slab in the downtown region. At the termini of the trench, traditional cast-in-place concrete retaining walls and a natural earth invert overlain by asphalt-concrete was assumed as the structural section. The mainline track and Reno Branch Connection were also included in this category of costs.

Quantities for the trench were developed by applying the principals of the Analysis of Wall and Invert Systems Analysis Report². The 2.1-mile long trench system was assumed to have

¹ Final Environmental Impact Statement, Reno Railroad Corridor, December 15, 2000, Nolte Associates, Inc., prepared for the Federal Highway Administration and Nevada Department of Transportation

² Analysis of Wall and Invert Systems Report, Reno Railroad Corridor, February, 2001, Nolte Associates, Inc., prepared for the City of Reno and Nevada Department of Transportation.

full-height 3-foot thick reinforced concrete diaphragm walls constructed with the slurry method in the downtown region. The full height of the wall was assumed to start at original grade and extend 5-feet into the jet grouted soil mass. In conformance with the wall and invert report, traditional reinforced concrete cantilever retaining walls were assumed at the termini of the trench. The invert system quantities were developed through examination of the proposed profile and preliminary engineering calculations that determined the varying thickness of both the temporary jet-grouted element and the permanent reinforced-concrete constituent. The jet-grouted mass thickness was varied along the alignment (where required) from a minimum thickness of 3-feet to a maximum thickness of 10-feet 9-inches. Whereas the reinforced concrete cast-in-place bottom slab was varied in thickness from a minimum of 2-feet up to 5-feet 3-inches. Each of the wall systems was examined at 20-foot increments while the invert system was examined at 200-foot increments.

The other large cost item included in this grouping is earthwork. These quantities were developed through traditional average-end-area methods using the proposed profile, original ground profile, and proposed trench section.

The unit costs developed for the most complex portions of this category, namely the walls and invert systems, were developed through collaboration with specialty contractors that have recently performed similar work throughout the world. All of these contractors used the preliminary engineering information and/or site visits to help determine unit costs. These contractors supplied unit costs in a high/low format. These ranges were narrowed to singular costs through consultation with a peer review panel of geotechnical and geotechnical/structural experts. This peer review committee was able to apply site-specific geotechnical data and project criteria to arrive at these singular values.

For earthwork unit costs, local contractors and members of our geotechnical group were used to help determine appropriate costs for excavation and special treatment and handling of the potentially contaminated materials.

Streets and Bridges

The composition of the category for streets and bridges consists of surface roadway work, grading where required, and delivery and installation of overhead superstructures (substructure work is included in Trench Construction). For the purposes of this Opinion of Probable Construction Costs it was assumed that the overheads would be precast prestressed concrete I-girder structures.

Since the items included in this group are typical for highway construction, the unit costs were derived from historic data supplied by the Departments of Transportation of Nevada and California, the Regional Transportation Commission and the consultants internal records. However, the costs associated with the precast bridge units were developed through discussions with precasting plants that have recently supplied similar items throughout Nevada.

Utilities

The Utilities collection of construction items contains items related to installation of new and relocation or modification of existing utilities. Included in this group are those items necessary for electricity, gas, high-pressure fuel, domestic water, storm water, sanitary sewer, telephone, cable, and fiber optics. Specifically, the three largest expenses in this group are the installation of the storm drain interceptor along Third Street, telephone service, and electrical related items.

Each effected utility was identified in the environmental process and specific details for improvements were determined or modified in preliminary engineering. The quantities for each of these utilities were produced through generation and review of the preliminary engineering drawings.

Deriving appropriate unit costs for these items is difficult without consultation with those effected by the changes. Therefore, the unit costs for each of the Utilities items were developed in conjunction with the local utility companies. For items associated with the storm drain interceptor, local contractors, doing similar work in the Reno vicinity were queried for appropriate unit costs.

Right-Of-Way And Easements

The effected properties for right-of-way and easement permanent-, temporary-, full- and partial-takes were identified through the environmental process and updated in preliminary engineering. These items were identified as being in the plan area of the trench, related work, or necessary project access locations using the proposed alignment, means and methods. Relocations have also been included in this category of costs.

Determination of costs for these items was completed in the environmental process and updated to reflect changes in preliminary engineering. The effected properties have been evaluated using county assessor maps and estimates to fair market value have been established to determined total costs.

Mitigation

Mitigation includes those items identified through the environmental and preliminary processes by the Nolte Team and the City of Reno as required to meliorate negative project effects to the surrounding community and resources.

Development of the mitigation quantities and items was accomplished through examination of the EIS, preliminary engineering plans, and Means and Methods Analysis Report³. After determining the magnitude of work required, approximate costs were assigned to each proposed treatment. The items of largest financial impact to this group are treatments of historical buildings, mitigation of cultural resources, and melioration of the effects of property acquisitions and displacements.

The materials quantities associated with the historic building treatments were developed through the generation and examination of the EIS and preliminary engineering documents. These treatments include the temporary relocation of three buildings (Southern Pacific Railroad Passenger Depot And Addition, American Railroad Express Station, Southern Pacific Railroad Freight House).

The magnitude of work required for mitigation of effects to cultural resources and property acquisitions and displacements was determined through review of the EIS and preliminary engineering plans and the Means and Methods Report. These items were estimated based on other mitigation requirements for work in the City of Reno.

³ Means and Methods Analysis Report, Reno Railroad Corridor, January, 2001, Nolte Associates, Inc., prepared for the City of Reno and Nevada Department of Transportation.

The costs of the historic building mitigation were produced through a cooperative effort with local construction companies that have successfully performed similar work in and about the City of Reno. The costs associated to the other mitigation items were developed collectively between the City of Reno and the Nolte Team by examining current local costs and costs associated with other projects in the immediate area.

Development of an Opinion of Probable Costs requires construction experience, professional judgement and historical data. It is necessary to make a number of assumptions as to actual conditions that will be encountered; the specific decisions of other design professionals; the means and methods of construction the contractor will employ; the cost and extent of labor, equipment, and materials the contractor will employ. Additional information concerning these assumptions can be found in the various reports prepared by the Nolte Team, and submitted as part of Preliminary Engineering for the project.